REPORT ON TRAVEL AND VISITS REGARDING THE CONTROL OF BARLEY DISEASES FOR LESSER DEVELOPED COUNTRIES OF THE WORLD

AID/DSAN-C-0024

April 16 or 18 - May 11, 1981

Dr. T. W. Carroll (TWC), Professor of Plant Pathology,

and

Mr. M. M. Harrabi (MMH), Graduate Student

Department of Plant Pathology

Montana State University

Itinerary

Depart Bozeman, April 16 (MMH) or April 18 (TWC) via SLC, N.Y., Paris - Rabat

Arrive at Rabat April 17 (MMH) or April 19 (TWC)

Leave Rabat April 24

Arrive Tunis through Marseille April 24 - Friday

Depart Tunis April 29

Arrive Damascus April 29, late afternoon

Drove to Aleppo that night

Depart Damascus May 5

Arrive Istanbul May 5

Depart Istanbul to Izmir May 5

Depart Izmir May 8 - Arrive Istanbul same day

Depart Istanbul May 8

Arrive Athens May 8

Depart Athens May 10

Arrive Denver May 10

Depart Denver May 11

Arrive Bozeman May 11

Purpose of the trip

1. To participate in the Barley Workshop held at Rabat, Morocco.

   Title of workshop:

   Barley diseases and associated breeding methodology

2. To collect isolates of barley pathogens from different parts of the Mediteranian region, including locations new to this project.
3. To assess the importance of fungal, bacterial and viral diseases in the region.
4. To select resistant material in the recurrent selection populations (RSP's) developed at Montana State University.
5. To make technical knowledge available.

Organizations and Persons Contacted

Inasmuch as Dr. E. L. Sharp will be writing a report on the visit of Montana-AID people to Morocco, this report will only pertain to the countries of Tunisia, Syria, and Turkey.

Tunisia

1. Office of Cereals

   Mr. A. Ladab, President

   Mr. L. Sendassi, Acting Head, Technical Division.

   Mr. Salah Rezgui

2. I.N.A.T.

   Mr. Kamel Belkodja, Former Director

   Mr. M. Jarraya, Director, effective May 1, 1981.

3. Ecole Superieure de Grandes Cultures du Kef (Agricultural School)

   Mr. R. Zoubeidi, Director

4. Central Tunisia Project - AID via Oregon State University. Housed in the old Ecole Agricole du Kef

   Mr. Amor Yahyaoui, Barley Breeder

Syria

1. ICARDA, Aleppo

   Dr. M. A. Nour, Director General,effective July 1, 1981

   Dr. Jit Srivastava, Director of the Cereal Improvement Program

   Dr. Mohammed Mekni, Leader of the Barley Improvement Program

   Mr. Mohammed Mushref, Research Assistant, Barley Improvement Program

   Dr. Miloudi Nachit, Leader of the Triticale Improvement Program

   Mr. Michael Michael, Research Assistant, Durum Wheat Improvement Program

   Mr. Issam Naji, Leader of Farmer Trials, Cereal Improvement Program

2. U.S. AID- Mission, Damascus

   Mr. Archie Hogan, Agricultural Development Officer

Turkey

1. Ege Regional Research Center, Menemen, Izmir

   Mr. Kasif Temiz, Director

   Mr. Cevdet Dutlu, Assistant Director

   Mr. Fikret Demirkan, Leader of the Barley Improvement Program, Western Region of Turkey

   Mr. Abdulkadir Basgul, Breeder, Barley Improvement Program, Western Region of Turkey

   Mr. Suleyman Guzel, Breeder, Barley Improvement Program, Western Region of Turkey

Accomplishments and Impressions

Tunisia:

Dr. Robert Jackson, AID, Washington, D.C.; Dr. John M. Poehlman, AID Reviewer, University of Missouri, Columbia; Dr. Eugene L. Sharp, Principal Investigator of the Montana AID-Barley Project; MMH, and TWC, arrived in the afternoon of April 24, and were met at the airport by Mr. Yahyaoui, and Mr. Rezgin, and then taken to a hotel. The following morning we were picked up by Mr. Yahyaoui and taken to the Office of Cereals, where we visited with Mr. Sendassi. He described the activities of the technical division. Later we met with Mr. Belkodja, and Mr. Jarraya who talked about INAT and its efforts. During that visit Mr. Jarraya requested that a formal agreement be developed between Montana State University (MSU) and INAT, with respect to the exchange of barley germplasm and technical assistance. Mr. Jarraya also mentioned that INAT wanted to send people to MSU for technical training. Later that morning, we met with Mr. Ladab. During our meeting, Dr. Sharp described the Montana AID Project on Barley. Mr. Ladab was enthusiastic about the transfer of technology from Montana to Tunisia. Mr. Ladab emphasized the new importance given to barley production by the Office of Cereals and the Tunisian Government. In the afternoon of April 25, we drove to Mateur to observe the barley nurseries of the Office of Cereals. Prevalent diseases were leaf rust, net blotch, scald, helminthosporium stripe and barley yellow dwarf. That evening we were hosted to a superb supper through the kind generosity of the Director of the Office of Cereals, Mr. Ladab. A stimulating and moving seminar followed the supper.

On April 26 we went by car in the early morning to the Beja Agricultural Experiment Station to observe barley nurseries. We were accompanied by Mr. Yahyaoui. Powdery mildew was most severe in several lines of barley. Helminthosporium stripe was scattered throughout many lines. Barley yellow dwarf was seen at the margins of the plots and in some lines of barley. Only a trace of net blotch was detected. On the way to El Kef, a farmer's field of barley was checked for diseases. Heavy scald and moderate net blotch were seen. At the Agricultural school at El Kef we talked with Mr. Zoubeidi who described the research and training objectives of his institution. In the afternoon we went to the barley plots, where we tagged about 200 plants each in the 1980-81 Scald RSP (RSP-5 Rrs-6 rowed population).

and the 1980-81 Net Blotch RSP (RSP-5 Rpt-6 rowed population). Dr. Jackson, Dr. Poehlman, Dr. Sharp, Mr. Yahyaoui, two technicians from the school, and MMH and TWC worked the two RSPs. Heavy powdery mildew was observed in scattered areas thoughout both RSPs. Barley yellow dwarf was severe in some plants, particularly those at the borders and in areas adjacent to the borders in both RSPs. A trace of scald and net blotch was also present in each RSP. The nurseries were properly space planted and well maintained. On the morning of April 27 Dr. Jackson, Dr. Sharp, and TWC met with Dr. Floyd E. Bolton, Principal Counselor of Agronomy for the AID Project on Agricultural Research for Central Tunisia (On leave from Oregon State University). Dr. Bolton exchanged important agronomic information with us. He also explained the Central Tunisia Project. That afternoon Dr. Jackson, Dr. Poehlman, and Dr. Sharp departed by airplane to Cairo, Egypt. On April 28, MMH and TWC were accompanied by Mr. Yahyaoui on a survey of diseases in farmer's fields within the El Fahs region of Tunisia. The barley development varied from heading to hard dough stage. The plants were under moisture stress as evidenced by their short stature and rolled and dried leaves. Many of the plants had dried heads and would yield no grain. According to Yahyaoui, less than 300 mm of precipitation fell in this area during the growing season. Apparently the extreme dryness here curtailed the development of diseases, for none was noticed. On April 29 we departed Tunis by airplane for Damascus.

Syria:

MMH and TWC arrived in Damascus on the evening of April 29 and drove to Aleppo with Dr. M. Mekni. We stayed that night and subsequent nights in the Baron Hotel because the guest house was full. The morning of April 30 we were driven to the ICARDA headquarters where we promptly devised a visitation schedule and took care of airline reservations, etc. Later that morning we visited the laboratories at Tel Hadya. The development of ICARDA over the last 4 years has been astonishing. In 1977 arrangements for the acquisition of land for the Tel Hadya research center were being made. Today Tel Hadya consists of farm equipment buildings, temporary laboratories, seed handling facilities, and harvest sheds. The research center occupies 1000 Ha. A 2.5 meter high chain-link fence surrounds the entire center and protects it from grazing animals. The afternoon of April 30 we met briefly with Dr. M. Mekni at the ICARDA headquarters to discuss barley breeding and disease resistance. Afterwards we visited the barley plots at Tel Hadya, including the 1980-81 Scald RSP (RSP-5 Rrs-6 rowed population) and three

earlier RSPs (RSP-5 Rrs-Scald; RSP-5 Rpt-Net Blotch; RSP-5 Reg (rs, pt) - Powdery Mildew) that were sent to ICARDA. They are being cycled locally by Mekni for possible use in the Mediterranean region. The Net Blotch RSP was being exploited in that 4 rows of fertile pollinator barleys (those of good agronomic performance with acceptable resistance to local diseases) alternated with 4 rows of the RSP barleys which contained male sterile plants. The outcrossed seed produced would be planted the next year so it would give rise to plants that could be cross pollinated by pollinator barleys, and so on. Mid-afternoon of April 30 we accompanied Mr. Issam Naji and Dr. M. Nachit to a farmer trial of cereals. In the barley trial, Beecher served as the ICARDA check, whereas Arabic Abied (white glumed, Syrian land race) and Arabic Asouad (black glumed, Syrian land race) served as the farmer checks. The checks are being compared to new ICARDA hybrids and selections relative to pest resistance and yield potential. All barleys in the trial were given a low level of nitrogen fertilization. The trial barleys were in turn compared with unfertilized farmer grown barley which surrounded the trial nursery on three sides. The farmer's barley consisted of a mixture of Arabic Abied and Arabic Asouad. According to Mr. Naji scald is consistently the most serious disease of barley in Syria, although leaf rust appeared to us to be the most prevalent disease this year in both trial and farmer barleys. Some covered smut was also present in the farmer's Arabic abied and asouad barleys. On May 1 we departed by car with Mr. M. Mushref and Mr. M. Michael at 7:00 AM for the Jebla Research Center near Lattakia. This center is 5 km from the Mediterranean Sea, and receives about 800 mm of rain annually. We tagged about 200 plants in the 1980-81 Net Blotch RSP-5, Rpt (6-row) population having the least powdery mildew and leaf rust, and displaying the best agronomic traits. The next morning we met with Dr. J. Srivastava and Dr. M. Mekni to discuss the cereal improvement program, with emphasis on the diagnosis and control of barley diseases. That afternoon, at the request of Dr. Srivastava, we surveyed the Key Location Disease Nurseries (KLDNs) for each of the following: Bread Wheat, Durum Wheat, Barley, and Triticale. Our evaluation of the nurseries with respect to plant diseases and especially virus diseases, and our conclusion and recommendation were presented to Dr. Srivastava in a written report. This report will be forwarded to Dr. M. A. Nour, who will become Director General of ICARDA, July 1, 1981. Infectious diseases present in bread and durum wheat were barley

yellow dwarf (trace to light infection), stripe rust (light to moderate infection), and pseudomonas syringae blight (trace to light infection associated with plants damaged by frost); infectious diseases in barley were barley yellow dwarf, leaf rust and powdery mildew (all trace to light infections). No diseases of importance were seen in the Triticale nursery. The morning of May 3 we drove to Tel Hadya and tagged about 200 plants in the 1980-81 Scald RSP-5, Rrs (6-row) population having the least disease and the best agronomic qualities. We were assisted by Mr. M. Mushref. The light rain that fell while we worked the Scald RSP eventually turned heavy so we rapidly finished tagging the plants, and sought shelter in the storage room for barley seed. The Scald RSP was generally free of scald, although much scald inoculum was present in artificially inoculated barley about 100 m away. The inoculated scald "spreader" plants exhibited severe symptoms on all leaves, including flag leaves. Thus, it appears that this RSP now contains a high level of field resistance to scald. At 7:00 AM on Monday, May 4, we departed Aleppo by car, arriving at the ICARDA guest house in Damascus at about 11:00 AM. Shortly thereafter T. Carroll met with Mr. Archie Hogan, Agricultural Development Officer, U.S.AID - Mission, Syria. During this meeting Mr. Hogan kindly arranged to send pathogen samples to the Plant Inspection Station, APHIS, USDA, at Jamaica, New York, via diplomatic channels. The pathogen samples were collected in Morocco, Tunisia, and Syria. Importation of these samples into the U.S. was authorized by APHIS, USDA, under Permit number PPQ-526-EDH, issued 3-30-81. Mr. Hogan, was also most helpful in obtaining confirmation of our airline reservations. He had a secretary at the U.S. Embassy handle all of the necessary details. We left Damascus the next morning for Istanbul and Izmir.

Turkey:

We arrived in Izmir the evening of May 5, and were met by Mr. Abdulkadir Basgul, and a driver from the Ege Regional Research Center, Menemen, Izmir, who took us to our hotel. The next morning, we were met again by Mr. Basgul and the driver, and taken to the Ege Research Center. We were received by Mr. Cevdet Dutlu, Assistant Director of the Center. During our brief visit with him we discussed the cereal improvement program at Izmir. Next, we talked with Mr. Kasif Temiz, Director of the Center. Our conversation focused on barley research in Turkey, and general concerns and objectives of the Ege Center. Later that morning we met with Mr. Fikret Demirkan, Leader of the Barley Improvement

Program, Western Region of Turkey, and Mr. A. Basgul and Mr. S. Guzel, Barley Breeders, to learn about the barley program at Izmir. Afterwards, we went to the field where we tagged 200 plants in the 1980-81 RSP-5 Rrs-Scald nursery. Only a trace of scald was present in this RSP, however severe scald infections were found in adjacent barley plots. Light to moderate leaf rust and spot blotch were also observed in the scald RSP. Two hundred plants were also tagged in the 1979-80 RSP-5, Rph-Leaf Rust. A light infection of leaf rust occurred in this RSP, and most of the individual plant infections appeared to be those of the resistant type of reaction. Traces of spot blotch, powdery mildew, and barley yellow dwarf were also seen in the Leaf Rust RSP. Just a few plants in the 1980-81 RSP-5 Rxt-Xanthomonas nursery were tagged because no Xanthomonas was observed. This RSP had moderate leaf rust, trace to light powdery mildew and spot blotch, and a trace of barley yellow dwarf. Mr. A. Basgul and Mr. S. Guzel assisted us with the tagging. Afterwards Mr. F. Demircan showed his barley plots and described his breeding program. In the late afternoon we talked again with Mr. C. Dutlu to report our activities and findings. Part of the time was spent editing the English summary for the doctoral dissertation Mr. Dutlu will present to his Graduate Committee on May 12, 1981. Before departing the Ege Center that evening for our hotel in Izmir, we met once more with Mr. Temiz. During this meeting we described our field efforts and observations. He requested that T. Carroll also write a report evaluating the barley program at Izmir. This report will be forwarded to Ankara. The following morning it rained so we stayed in the hotel and wrote our impressions of the visits. We also summarized the information regarding the pathogen samples. That afternoon we met for the last time with Mr. A. Basgul to discuss the Montana AID Contract and the barley program at Izmir. On May 8 we flew from Izmir to Istanbul and then to Athens. On May 10 we departed Athens for Denver, via New York. We stayed overnight in Denver, and traveled to Bozeman the next day by air.

In the main, the trip was a huge success. Our Scald and Leaf Rust RSPs have obtained a good level of resistance to their respective pathogens. In addition, the timing of the visit coincided well with plant growth and disease incidence. We collected 31 disease specimens, particularly in newer areas, to add to our virulence pool for incorporating broad-based resistance. Finally, there was a real interest in and acceptance of our methods for developing broad-based resistance to diseases of barley. In fact, the breeders at ICARDA and Izmir are already exploiting our RSPs for their own use.